

Report for 2002NY4B: Supporting Community Watershed Restoration Efforts in Catatonk Creek

There are no reported publications resulting from this project.

Report Follows:

Problem & Research Objectives: The headwaters of the Susquehanna River within New York State are characterized by excessive flooding during major storm events and spring snowmelt. The terrain within the Upper Susquehanna River sub-basins includes rolling hills with steep walled side valleys that focus runoff to feed the main river flows. Readily erodible glacial deposits are present along streambanks and blanket the shale bedrock in upland areas. Because of the steep gradients and glacial till deposits, the feeder streams can carry large sediment and gravel loads resulting in streambank erosion, sedimentation, gravel deposition and flooding. This project will explore these issues within the Catatonk Creek watersheds in Tioga and Tompkins County, New York in collaboration with personnel from the Upper Susquehanna Coalition.

The Upper Susquehanna Coalition is a grass roots based organization of county natural resource professionals that provide technical support to local stakeholders. This project provides a mechanism to add an academic component to this partnership to help inform and educate the citizens groups about the physical and chemical hydrology within their watersheds.

Objectives:

- Continue assessments of the Catatonk Watershed to document potential project sites for wetlands construction
- Compare physical and chemical hydrology within two adjacent Catatonk watersheds (Miller Creek and Sulfur Springs) that experience differences in sediment loading and stream flow on a storm event and seasonal basis.
- Provide baseline data for a watershed hydrological model to aid in selecting effective implementation projects to determine how effectively they might modify flows associated with flooding
- Use the information gathered to develop at least one implementation proposal to address flooding/erosion issues

Methodology:

Comparative hydrology within the Miller Creek and Sulphur Springs sub-basins within the Catatonk Watershed is being assessed using GIS based tools in conjunction with measurement of water quantity and quality parameters.

The USC and Penn State University have developed an ArcView GIS-based assessment tool for stream corridor problems and wetland development potential. The tool manages data, maps and photographs in an interactive format. The USC and Binghamton University students are using this tool to continue assessments within the Catatonk Creek Watershed.

The USC have deployed a continuous rainfall gage and five flow meters (stream height gages) in high priority tributaries to collect pre-construction flow information. Based on the results of the summer 2001 flow measurements within Catatonk Watersheds, we are collecting water and suspended sediment samples on a "significant event basis" schedule using automated stormwater runoff samplers at two of the flow measurement sites near the mouth of the Miller Creek and Sulfur Springs sub-watersheds. Base flow sampling is also ongoing in these watersheds on a bi-weekly basis. Normal water chemistry parameters (i.e. temperature, pH, conductivity) as well as metal concentrations are being assessed. The stream height and gages in conjunction with manual flow velocity and volume measurements are being used to construct stream rating curves.

All of this information is being used for input and calibration within hydrological models based on Watershed Modeling Systems (WMS) interfaces.

Principal Findings & Significance:

Data collection and generation for this project is part of an ongoing effort to study hydrology and sediment sources within the Catatonk Creek watersheds in order to collect baseline data to help predict effects prior to wetland construction.

Data collection began in June 2002 and will continue through May 2003. Significant findings can not be elaborated upon in detail until the entire year of data has been collected and analyzed. However, preliminary observations indicate surface flow is ephemeral in Sulfur Springs but sustained year round in Miller Creek. Sediment loading is of much greater concern in Sulfur Springs than in Miller Creek. Water levels in Sulfur Springs respond more quickly and are more flashy after storm events than the response in Miller Creek. Part of the controls for the hydrologic differences between the adjacent watersheds is due to differences in topographic gradients in the two watersheds, especially near the mouths of the watersheds.

Based on the results from this project, wetland construction is being planned within the Sulfur Springs sub-watershed in an effort to reduce peak flows, sustain base flow and alleviate erosion problems. No wetland construction is planned for Miller Creek. Miller Creek will continue to be monitored in order to provide an unperturbed watershed in order to document hydrologic effects from wetlands construction in the adjacent watershed.

Notable Achievements:

Several proposals have been submitted that have used ongoing data collection from this project in order to acquire baseline information for future studies. Work on this project has resulted in a collaboration with the USC on a proposal submitted in fall 2002 for the EPA Watershed Initiative that includes work in the Catatonk and other watersheds in the Upper Susquehanna for integrated ecosystem based studies; this proposal was chosen for funding. We are also presently working with the US Army Corp of Engineers to leverage results from this project to scope out a workplan for a long term hydrologic study before, during and after wetlands construction in Catatonk watersheds. Both of these efforts have allowed us to meet the goal of proposal generation outlined within the project objectives.